Amendments to the Claims

This listing of claims will replace the originally filed claims in the application.

Listing of Claims:

Claims 1 – 19 (cancelled).

Claims 20 – 43 (cancelled).

Claim 44 (new): A method which may be used for converting gaseous hydrocarbons to liquid hydrocarbons in which a Fischer-Tropsch process is employed, said method comprising:

a) producing liquid hydrocarbons and a waste gas, wherein said waste gas comprises:
   1) hydrogen;
   2) carbon dioxide; and
   3) hydrocarbons with no more than 6 carbon atoms; and

b) separating said waste gas into at least three product streams, wherein said separation comprises the production of:
   1) at least one gas stream comprising methane, wherein the recovery rate of hydrogen and carbon monoxide is at least about 60%;
   2) at least one gas stream with a carbon dioxide recovery rate of at least about 40%; and
   3) at least one supplementary gas stream, wherein said supplementary gas stream comprises hydrocarbons with at least 2 carbon atoms.

Claim 45 (new): The method of claim 44, wherein said separation of said waste gas further comprises separation with a PSA separation unit having at least one adsorber.

Claim 46 (new): The method of claim 45, further comprising producing at least one gas stream comprising hydrogen with said PSA separation unit.

Claim 47 (new): The method of claim 45, wherein said separating said waste gas further comprises producing at least one gas stream comprising hydrogen with a second PSA separation unit.

Claim 48 (new): The method of claim 45, wherein:

a) said waste gas further comprises nitrogen; and

b) said separation of said waste gas further comprises producing at least one gas stream comprising nitrogen.

Claim 49 (new): The method of claim 45, wherein each adsorber of said PSA separation unit comprises:

a) a first bed comprising alumina;

b) a second bed comprising silica gel; and

c) a third bed comprising at least one adsorbent, wherein:

1) said adsorbent comprises at least one member selected from the group consisting of:

i) zeolite;

ii) carbon molecular sieves; and

iii) titanium silicate; and

2) said adsorbent has an average pore size between about 3.4 Å and about 5 Å.

Claim 50 (new): The method of claim 49, wherein said average pore size is between about 3.7 Å and about 4.4 Å.

Claim 51 (new): The method of claim 49, wherein said waste gas flows through said first bed, then through said second bed, and finally through said third bed.

Claim 52 (new): The method of claim 49, wherein each said adsorber of said PSA separation unit further comprises a fourth adsorbent bed which is located, in said waste gas flow direction, after said third bed.

Claim 53 (new): The method of claim 52, wherein:

a) said adsorbent of said third bed comprises carbon molecular sieves; and

b) said fourth bed comprises zeolite or an activated charcoal.

Claim 54 (new): The method of claim 53, further comprising producing at least one gas stream comprising hydrogen with said PSA separation unit.

Claim 55 (new): The method of claim 47, wherein an adsorber of said second PSA separation unit comprises an adsorbent bed comprising at least one activated charcoal.

Claim 56 (new): The method of claim 49, wherein each adsorber of said PSA separation unit comprises a fourth or a fifth bed that comprises at least one member selected from the group consisting of:

a) titanium-silicate; and

b) zeolite.

Claim 57 (new): The method of claim 56, wherein:

a) said waste gas comprises nitrogen; and

b) said separation of said waste gas further comprises producing at least one gas stream comprising nitrogen.

Claim 58 (new): The method of claim 44, further comprising:

a) treating said at least one gas stream comprising methane with a cryogenic unit, wherein said treating occurs downstream of said waste gas separation;

b) producing at least one stream consisting essentially of hydrogen and carbon monoxide; and

c) producing at least one stream comprising methane.

Claim 59 (new): The method of claim 44, further comprising:

a) treating said gas stream comprising methane with a cryogenic unit, wherein said treating occurs downstream of said waste gas separation;

b) producing at least one stream consisting essentially of hydrogen;

c) producing at least one stream comprising carbon monoxide; and

d) producing at least one stream consisting essentially of methane.

Claim 60 (new): The method of claim 44, further comprising:

a) treating said gas stream comprising methane first with a PSA adsorber, wherein said treating occurs downstream of said waste gas separation;

b) producing at least one stream consisting essentially of hydrogen; and

c) producing at least one stream comprising carbon monoxide and methane.

Claim 61 (new): The method of claim 44, further comprising synthesizing a gas comprising hydrogen and carbon monoxide from a reagent gas, wherein said reagent gas comprises at least a portion of said gas stream comprising methane.

Claim 62 (new): The method of claim 44, wherein at least a portion of said gas stream comprising methane is used as a reagent gas in said Fischer-Tropsch process.

Claim 63 (new): The method of claim 44, further comprising using at least a portion of said supplementary gas stream as fuel.

Claim 64 (new): The method of claim 44, further comprising using at least a portion of said supplementary gas as a reagent gas for the generation of synthesis gas.

Claim 65 (new): The method of claim 46, further comprising using at least a portion of said gas stream comprising hydrogen for hydrocracking.

Claim 66 (new): The method of claim 47, further comprising using at least a portion of said gas stream comprising hydrogen for hydrocracking.

Claim 67 (new): The method of claim 59, further comprising using at least a portion of said gas stream comprising hydrogen for hydrocracking.

Claim 68 (new): The method of claim 60, further comprising using at least a portion of said gas stream comprising hydrogen for hydrocracking.

Claim 69 (new): The method of claim 44, wherein at least a portion of said stream with a carbon dioxide recovery rate of at least about 40%, is used as a reagent gas for producing a synthesis gas which comprises hydrogen and carbon monoxide.

Claim 70 (new): A method which may be used for converting gaseous hydrocarbons to liquid hydrocarbons in which a Fischer-Tropsch process is employed, wherein:

a) said method comprises:
   1) producing liquid hydrocarbons and a waste gas, wherein said waste gas comprises:
      i) hydrogen;
      ii) carbon dioxide;
      iii) hydrocarbons with no more than 6 carbon atoms; and
      iv) nitrogen; and
   2) separating said waste gas into at least three product streams, wherein said separation comprises the production of:

i) at least one gas stream comprising methane, wherein the recovery rate of hydrogen and carbon monoxide is at least about 60%;

ii) at least one gas stream with a carbon dioxide recovery rate of at least about 40%;

iii) at least one supplementary gas stream, wherein said supplementary gas stream comprises hydrocarbons with at least 2 carbon atoms; and

iv) at least one gas stream comprising nitrogen;

b) said separating said waste gas further comprises separation with a PSA separation unit having at least one adsorber;

c) each said adsorber of said PSA separation unit comprises:

1) a first bed comprising alumina;

2) a second bed comprising silica gel;

3) a third bed comprising at least one adsorbent, wherein:

i) said adsorbent comprises at least one member selected from the group consisting of:

aa) zeolite;

bb) carbon molecular sieves; and

cc) titanium silicate; and

ii) said adsorbent has an average pore sized between about 3.4 Å and about 5 Å; and

4) a fourth bed comprising at least one member selected from the group consisting of:

i) titanium-silicate;and

ii) zeolite; and

d) at least one gas stream comprising hydrogen is produced by said PSA separation unit.

Claim 71 (new): A method which may be used for converting gaseous hydrocarbons to liquid hydrocarbons in which a Fischer-Tropsch process is employed, said method comprising:

a) producing liquid hydrocarbons and a waste gas, wherein said waste gas comprises:

1) hydrogen;

2) carbon dioxide; and

3) hydrocarbons with no more than 6 carbon atoms;

b) separating said waste gas into at least three product streams, with a PSA separation unit, wherein said separation comprises the production of:
   1) at least one gas stream comprising methane, wherein the recovery rate of hydrogen and carbon monoxide is at least about 60%;
   2) at least one gas stream with a carbon dioxide recovery rate of at least about 40%; and
   3) at least one supplementary gas stream, wherein said supplementary gas stream comprises hydrocarbons with at least 2 carbon atoms;

c) treating said gas stream comprising methane with a cryogenic unit, wherein said treating comprises:
   1) producing at least one stream consisting essentially of hydrogen;
   2) producing at least one stream comprising carbon monoxide; and
   3) producing at least one stream consisting essentially of methane; and

d) hydrocracking at least a portion of said stream consisting essentially of hydrogen.